THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 43. OCTOBER 27, 1951 VOL. 63.

SOME OBSERVATIONS ON VITAMIN A REQUIREMENTS OF PIGS

BY

R. BRAUDE, S. K. KON, K. G. MITCHELL

AND

S. Y. THOMPSON,

NATIONAL INSTITUTE FOR RESEARCH IN DAIRYING, UNIVERSITY OF READING

INTRODUCTION

During our work on the conversion of carotene to vitamin A in the intestine (Thompson, Braude, Coates, Cowie, Ganguly & Kon, 1949, 1950; Thompson, Ganguly & Kon, 1949) it was attempted to produce naturally suckled young piglets with very low reserves of vitamin A. We did not anticipate any great difficulties since deficiency of vitamin A is known to occur among pigs under practical conditions and has been produced by us experimentally in older pigs (Foot, Golding & Kon, 1938; Braude, Foot, Henry, Kon, Thompson & Mead, 1941). We did not, however, succeed and since our experience may be of general interest, we think it worth recording.

EXPERIMENTAL

The experiment was started with one of the best Large White sows in the Institute herd, No. 2104, born in November, 1944, that had produced five normal litters. During this time she had been kept under good conditions with access to pasture and had been fed a good quality proprietary sow and weaners meal; in addition, she received once weekly about 30 g. of controlled mixture of cod-liver oil.* On April 24th, 1948, after weaning her fifth litter, she was put on a vitamin A deficient diet and kept indoors continuously. The diet consisted of barley meal 50 per cent. wheatfeed 40 per cent. and white fish meal 10 per cent. On that diet she produced four litters. At each farrowing a sample of colostrum was taken; samples of milk were collected 12 to 14 days after farrowing and all samples were analysed for vitamin A. The colostrum and milk samples were diluted with water, and the fat extracted by the method of Olson, Hegsted and Peterson (1939). The fat extracts, however, were washed twice with water and dried over anhydrous sodium sulphate before evaporation of the solvent. The fat was weighed, saponified and extracted as described by Gillam, Henry and Kon (1937). Vitamin A was measured by the $SbCl_3$ reaction. Table I shows details concerning the farrowings and the respective vitamin A values.

The vitamin A content of both colostrum and milk from Sow 2104 after her first farrowing on the vitamin A deficient diet was considerably lower than the average values for Large White sows fed on our normal diet (Braude, Coates, Henry, Kon, Rowland, Thompson & Walker, 1947). The colostrum contained 53 I.U. per g. fat against 85 I.U. per g. fat for normal sows farrowing in summer, and the values for milk were 4·9 I.U. per g. fat against 13·3 I.U. per g. fat. In her next two farrowings the drop in the vitamin A content of colostrum was slight, but this was followed by a drastic decline at the fourth farrowing on the vitamin A deficient diet. In the milk there was a further drop after the second and third farrowings, but it appears that the minimum level was then reached as the level after the fourth farrowing was slightly higher than after the third.

The data in Table I indicate that the reserves of vitamin A accumulated by the sow before she was put on the deficient diet must have been very considerable—sufficient to allow her to produce four normal litters, and to rear the first three well. Just before producing the last litter (farrowed on February 7th, 1950), the sow began to show the first clinical signs of vitamin A deficiency: refusal of food and characteristic stiffness of leg joints causing abnormal walk. After removal of her last litter the sow, although mated in several consecutive heats, did not conceive again. Her condition gradually deteriorated and she could hardly get up on her feet when she was sent to slaughter on December 8th, 1950. A week before slaughter her blood content of vitamin A was only 16 I.U. per 100 ml., whereas 9 and 18 months previously it was 46 and 45 I.U. per 100 ml. respectively.* The vitamin A content of the liver after slaughter was 7·4 I.U. per g., or 18,000 I.U. in the whole liver.† Apparently this residual quantity of vitamin A in the liver could not be mobilised by the animal in the case of acute need.

TABLE I

DETAILS OF FARROWINGS AND VITAMIN A IN THE COLOSTRUM AND MILK OF SOW NO. 2104

Date of farrowing	No. of piglets born alive	No. of piglets born dead	Piglets weaned at eight weeks		Vitamin A content	
			No.	Average weight, lb.	Colostrum at birth I.U. per g. fat	Milk 12–14 days after farrowing, I.U. per g. fat
16.8.48	10	2	7*	31·5	53	4·9
15.2.49	15	0	8†	34·3	51	2·5
11.8.49	11	0	11	29·6	40	2·0
7.2.50	12	3	—‡	—	5·4	2·4

* Two piglets removed from the litter at seven weeks, for purpose of another experiment.

† Three piglets transferred to another sow at birth.

‡ All the litter was very weak, and after four piglets died the rest were reared artificially.

* Veterinary cod-liver oil with a minimum of 500 I.U. of vitamin A and 50 I.U. of vitamin D per g.

* Blood vitamin A was estimated on plasma by the method described by Thompson, Ganguly and Kon (1949).

† Liver vitamin A was extracted by the method of Davies (1933).

The first litter produced by Sow 2104 on the vitamin A deficient diet was quite normal at weaning in spite of the fact that the vitamin A content of both the colostrum and milk was low and also that the suckling pig meal which the piglets received in the creep was free from vitamin A. The meal consisted of wheatfeed 41 per cent., barley meal 25 per cent., dried skim milk free from vitamin A 21 per cent., white fish meal 10 per cent., dried brewer's yeast 3 per cent. The seven weaners averaged 31·5 lb. at eight weeks. Three gilts out of this litter were retained for breeding and were kept from birth either indoors or in a concrete paddock, never being allowed access to pasture or soil. After weaning, these three gilts received the same vitamin A deficient ration as given to Sow 2104. No signs of deficiency occurred until the pigs were about ten months old, when refusals of food and characteristic tip-toe walk pointed to the onset of clinical signs. However, the three gilts were mated successfully, the first in June, 1949, and the other two some six or eight weeks later. Blood samples from the gilts were taken at intervals and were analysed for vitamin A content (Table II).

TABLE II

VARIATION IN TOTAL VITAMIN A IN BLOOD PLASMA FROM THREE GILTS REARED ON THE VITAMIN A DEFICIENT DIET

Date of mating	I.U. per 100 ml. blood		
	Gilt 2997	Gilt 2996	Gilt 2998
March 3rd, 1949	28	34	31
April 4th	24	17	53
„ 27th	13	31	32
July 7th	Sample lost	14	23
Sept. 24th, after farrowing ...	8	—	—
„ 30th	—	18	15
Nov. 8th, following vitamin A treatment	—	35	38
Nov. 17th after farrowing ...	—	31	—
„ 26th „ „ ...	—	—	25
Dec. 7th	—	25	46

The first gilt to farrow, No. 2997, on September 24th, 1949, produced 13 pigs, all very weak at birth and showing weakness in the rear legs, making them unable to walk, or suckle properly. Some were breathing heavily and some had patches of " hair curls " (patches of rather long hair). No obvious abnormalities of the eyes were observed. Nine of the pigs did not survive the first 24 hours and all the remaining, except one which survived eight days, died or were killed because of extreme weakness before they were four days old. A sample of colostrum was taken at birth and found to be very low in vitamin A (see Table III). At the time of farrowing the gilt was in a very bad way, and was hardly able to get to her feet. After farrowing, she appeared to get worse and on September 26th, 1949, she was given 500,000 I.U. of vitamin A by mouth, allowed access to a grass paddock for about one and a half hours daily, and given a normal diet. She began to improve very rapidly, being noticeably better after 10 to 14 days. She was mated successfully and on April 19th, 1950, produced a normal litter of 13 pigs of which she reared eleven.

The experience with the first gilt, and the trend in blood content of vitamin A shown in Table II, indicated that the two other gilts, Nos. 2996 and 2998, which at the time were about halfway through the pregnancy period, would behave like the first. In an effort to produce viable litters both gilts were given 10 g. of controlled mixture of cod-liver oil daily for the remainder of their pregnancy (approximately six and eight weeks respectively).

TABLE III

VITAMIN A CONTENT OF COLOSTRUM AND MILK FROM THREE GILTS REARED ON THE VITAMIN A DEFICIENT DIET

Diet		Colostrum I.U. per g. fat	Milk I.U. per g. fat
Gilt 2997	Vitamin A deficient ...	3·9	—
„ 2996	After six weeks vitamin A supplementation	30·3	3·6
„ 2998	After eight weeks vitamin A supplementation	33·7	3·0

Both gilts produced normal litters. The vitamin A content of their blood taken at various stages (Table II) shows clearly the recovery due to supplementation of the diet with vitamin A.

In Table III the vitamin A content of colostrum and milk of the three gilts is recorded. In Table IV, the vitamin A content of the blood and liver of piglets from the litters of the three gilts and also from the second and fourth litters of Sow 2104 while on the vitamin A deficient diet is given. The piglets were killed or died at various ages as shown in the Table.

TABLE IV

VITAMIN A CONTENT OF BLOOD AND LIVER OF PIGLETS FROM LITTERS OF GILTS 2996, 2997 AND 2998, AND SOW 2104

	Blood	Liver	
	I.U. per 100 ml.	I.U. per g.	I.U. per liver
Piglets from litter of Gilt 2997			
Killed at birth before suckling	8·6	0·19	4·6
	7·5	0·43	7·2
	—	0·15	3·4
	—	0·14	3·6
Killed within five hours of birth (average of four piglets) ...	—	0·34	10·0
Died by third day (average of three piglets)	—	0·57	20·0
Piglets from litter of Gilt 2996			
Killed at birth before suckling	26·9	4·1	82
Died fourth day	—	11·0	459
Killed 20th day	24·7	6·7	720
Piglets from litter of Gilt 2998			
Killed seven hours after farrowing	22·3	9·6	269
Killed eleventh day	42·7	4·0	340
Piglets from second litter of Sow 2104			
Killed when five weeks old ...	53·0	9·0	549
When approximately five months old	39·0	—	—
	32·0	—	—
	36·6	—	—
	29·5	—	—
	31·8	—	—
	38·1	—	—
Piglets from fourth litter of Sow 2104			
Killed at birth before suckling	17·0	0·1	2·1
„ four hours after birth...	—	0·1	1·8
Died third day	—	0·9	27
Killed 15th day	19·4	1·2	112
Died on 23rd day	—	0·4	33
Killed 45th day	—	1·0	92
„ 45th „	5·0	0·8	42
„ 48th „	—	0·2	45

When Sow 2104 farrowed her second litter she had been deprived for nearly a year of any source of vitamin A, and the litter itself was brought up without any access to the vitamin except that obtained from the mother's colostrum and milk. In spite of this, the figures in Table IV show that, even when the piglets were five months old, their blood contained appreciable amounts of vitamin A. The blood and liver samples from piglets of the fourth litter of Sow 2104, born when she had been nearly two years on the vitamin A deficient diet, indicate that the piglets were born with hardly any reserves of vitamin A, but that they were able to obtain enough vitamin from the colostrum and milk of the dam to increase their reserves appreciably. In spite of this, the litter did badly, several of the piglets dying during the suckling period, and it would seem that they were unable to obtain sufficient vitamin A to meet the requirements for normal growth.

The values for the litters of the three gilts show clearly that the piglets of Gilt 2997, which did not receive any vitamin A before farrowing, were born with very low reserves of vitamin A. The litters of two other gilts, however, which were given vitamin A for six to eight weeks before farrowing, were born with appreciable reserves of this vitamin which rapidly increased following suckling.

Discussion

It has long been known that animals accumulate large stores of vitamin A and are able to call on these stores and make use of them in the absence of the vitamin in the diet. Experience in this country in war time with human volunteers brought out the surprising fact that normal adults take something like 18 months to become seriously depleted of vitamin A (Hume & Krebs, 1949). Our isolated experience with Sow 2104 indicates that it took her about 20 months to show symptoms of depletion, during which period she produced four normal litters. If her behaviour is any indication of conditions in normal breeding stock, it would seem that sows previously well-managed would carry reserves of vitamin A sufficient to tide them over a reasonable period of temporary deprivation with no ill effects. In fact, gilts reared from the first litter of Sow 2104, produced after she had had the vitamin A deficient diet for four months, obtained enough vitamin A from her in the womb, and from her colostrum and milk after birth, to reach maturity and conceive successfully without access to any other source of vitamin A. However, by this time, the limit must have been reached, since Gilt 2997, which was allowed to farrow without any supplementation of vitamin A, produced an abnormal non-viable litter, was herself on the verge of death, and was saved only by a substantial dose of vitamin A. Apparently the long period of deprivation did not cause permanent damage to this gilt, since she recovered rapidly when given the vitamin and thereafter lived to produce normal litters. Nor were her litter sisters permanently affected, since they produced normal litters when given a moderate quantity of vitamin A daily, beginning at the middle of their first pregnancy.

Thus our attempt to produce naturally suckled young piglets devoid of vitamin A reserves was not successful. Either normal litters were born at a stage when the mother still had plenty of vitamin A to pass on to them (first three litters of Sow 2104, and litters of Gilts 2996 and 2998), or the young were born abnormal and non-viable when the mother's mobilisable reserves of vitamin A were exhausted at the time of farrowing (litter of Gilt 2997), or the young were born normal with low reserves of vitamin A, but did not grow well because they were unable to obtain sufficient amounts of the vitamin from the dam's milk to meet the requirements for normal growth (fourth litter of Sow 2104). It appears that one cannot deplete the colostrum and milk of the sow of vitamin A and maintain her ability to rear viable piglets. We are now investigating the possibility of raising piglets on the bottle with sow's milk with the fat fraction replaced by a suitable vitamin A-free fat.

Summary

In an attempt to produce naturally suckled young piglets with very low reserves of vitamin A, one sow that had already produced five litters on a normal diet was deprived of vitamin A for nearly two years, during which time she produced a further four litters apparently normal at birth, but reared successfully only the first three. Three gilts from her first litter on the vitamin A deficient diet were kept on the same diet, and produced litters of their own. The degree of vitamin A depletion of the animals was studied by analysis of blood, colostrum, milk and livers.

References

Braude, R., Coates, M. E., Henry, K. M., Kon, S. K., Rowland, S. J., Thompson, S. Y., & Walker, D. M. (1947.) *Brit. J. Nutrit.* **1.** 64.

———, Foot, A. S., Henry, K. M., Kon, S. K., Thompson, S. Y., & Mead, T. H. (1941.) *Biochem. J.* **35.** 693.

Davies, A. W. (1933.) *Ibid.* **27.** 1770.

Foot, A. S., Golding, J., & Kon, S. K. (1938.) The vitamin A requirements of pigs. Reading: Nat. Inst. Res. Dairying.

Gillam, A. E., Henry, K. M., & Kon, S. K. (1937.) Milk and Nutrition, I., p. 45. Reading: Nat. Inst. Res. Dairying.

Hume, E. M., & Krebs, H. A. (1949.) Spec. Rep. Ser. Med. Res. Coun., Lond., No. 264.

Olson, F. R., Hegsted, D. M., & Peterson, W. H. (1939.) *J. Dairy Sci.* **22.** 63.

Thompson, S. Y., Braude, R., Coates, M. E., Cowie, A. T., Ganguly, J., & Kon, S. K. (1949.) *Biochem. J.* **44.** ix; and (1950.) *Brit. J. Nutrit.* **4.** 398.

———, Ganguly, J., & Kon, S. K. (1949.) *Ibid.* **3.** 50.

BRITISH HORSE SOCIETY

The British Horse Society (66, Sloane Street, London, S.W.1) announce the following lectures and practical demonstrations to be held in the Riding School, Hyde Park Barracks, Knightsbridge, London, S.W.7:—

Tuesday, October 30th, 1951, at 7 p.m.—"Training and Breaking in a Hack" (demonstrated with a green and a fully trained horse) by George Brine, Esq.

Tuesday, November 6th, 1951, at 7 p.m.—"Fundamentals of Dressage" by E. Schmit-Jensen, Esq., assisted by Miss D. Guy of the Fulmer School of Equitation.

Tuesday, November 13th, 1951, at 7 p.m.—"The Development of Modern Show Jumping" by Co'onel A. B. J. Scott, D.S.O., M.C.

Particulars of prices of admission, seat reservation, etc., can be obtained on application to the Society at the address given.

* * * * *

Weekly Wisdom

He knew that when once a basis of confidence has been established, fair give-and-take is as effective between States as it is between individuals.—The Times, on Mr. Liaquat Ali Khan, assassinated Prime Minister of Pakistan.

* * * * *

Poultry have been excluded from the Dairy Show, the Ministry of Agriculture having decided that the risk of spreading fowl pest is too great to allow of a licence being granted. Entry fees received for exhibits in this section have been returned.

A LABORATORY CONSIDERATION OF THE TREATMENT OF *ACTINOBACILLUS LIGNIÈRESI* INFECTION

BY

H. WILLIAMS SMITH,

LIVESTOCK RESEARCH STATION, ANIMAL HEALTH TRUST, HOUGHTON GRANGE, HUNTINGDON

In the past, potassium iodide was used quite commonly in human and veterinary medicine. Its popularity has since declined. It is still prescribed, however, for the treatment of *Actinobacillus lignièresi* infection for which it is considered to be of specific value.

It was decided, therefore, to study the *in-vitro* action of potassium iodide on *A. lignièresi*. Since some clinicians consider that mercuric iodide has advantages over potassium iodide in the treatment of wooden tongue, the action of this drug was also studied. A study of the activity of some of the more modern therapeutic substances was also included in the investigation.

MATERIALS AND METHODS

Five of the seven *A. lignièresi* cultures used in this work, Nos. 1, 2, 3, 4 and 5, had been recently isolated from cases of wooden tongue in cows. The remaining cultures, Nos. 4189 and 4191, were obtained through the kindness of Dr. S. T. Cowan, of the National Collection of Type Cultures, Colindale.

The sensitivity of the cultures to the various agents was studied by a serial dilution method in liquid medium and by the ditch-plate method.

Liquid Medium Method.—Two-fold serial dilutions of the agents under test were made in 5 ml. of liquid medium. Each tube was then inoculated with an 18-hour broth culture of a strain of *A. lignièresi* diluted so that each tube finally contained approximately 500 bacteria per ml. The tubes were incubated for 24 hours at 37° C. and read, the highest dilution of the agent that inhibited bacterial growth being noted. Nutrient broth was used for carrying out the tests with potassium iodide, mercuric iodide and penicillin. For determining sulphonamide sensitivity nutrient broth, from which sulphonamide-inhibitors had been removed by means of lysed horse erythrocytes according to the method of Evans (1948), was used.

Ditch-plate Method.—The ditch-plates were prepared in the usual way, the media in the ditch containing different concentrations of the agents under test. The media used for the sulphonamide tests were prepared from inhibitor-freed broth. The plates were held in the ice-chest for 24 hours after preparation to allow diffusion to take place from the ditch and then streaked with suitably diluted cultures of *A. lignièresi* and other bacteria whose *in-vitro* and *in-vivo* reactions on sulphonamides and penicillin were known. Those were the " Oxford " staphylococcus, a haemolytic Group C. streptococcus, *Strep. pneumoniae, Strep. agalactiae, Strep. dysgalactiae, Strep. faecalis* and *Salm. dublin*. The plates were then incubated for 24 hours at 37° C., when the degree of inhibition of growth was noted.

RESULTS

The results of the sensitivity tests with potassium iodide, mercuric iodide, penicillin, sulphanilamide, sulphapyridine, sulphathiazole and sulphamezathine using liquid medium are illustrated in Table I. The minimum amount of each drug necessary to produce bacterial inhibition is expressed as a percentage solution for potassium iodide and mercuric iodide, as mg. per 100 ml. for the sulphonamides and units per ml. for penicillin.

Potassium Iodide

All seven strains of *A. lignièresi* grew prolifically in broth containing 4 per cent. potassium iodide, a concentration of 8 per cent., *i.e.*, the next dilution tested, being required to inhibit their growth. These results were confirmed by ditch-plate tests, the bacteria growing up to and over ditches containing 4 per cent. potassium iodide. Potassium iodide did not inhibit a number of other bacteria tested.

Mercuric Iodide

Mercuric iodide, in contrast to potassium iodide, had a pronounced inhibitory effect on *A. lignièresi;* all the strains were inhibited by concentration of 0·004 per cent., and three by 0·001 per cent. The addition of 5 per cent. bovine serum to the media usually resulted in twice the amount of mercuric iodide being required to inhibit bacterial growth.

Penicillin

The seven strains were only slightly sensitive to penicillin, three being inhibited by 0·5 unit per ml. and four requiring 1·0 unit per ml. before bacterial growth was completely inhibited. These results were confirmed by ditch-plate tests, a much greater degree of resistance being exhibited by *A. lignièresi* than by the " Oxford " staphylococcus, *Strep. agalactiae*, the Group C. *streptococcus* and *Strep. pneumoniae*.

TABLE I

MINIMUM INHIBITING CONCENTRATION OF POTASSIUM IODIDE, MERCURIC IODIDE, PENICILLIN AND SULPHONAMIDES FOR *Actinobacillus lignièresi*

Strain of *A. lignièresi*	Concentration required to inhibit bacterial growth of						
	Potassium iodide (per cent.)	Mercuric iodide (per cent.)	Penicillin (units per ml.)	Sulphanilamide (mg. per 100 ml.)	Sulphapyridine (mg. per 100 ml.)	Sulphathiazole (mg. per 100 ml.)	Sulphamezathine (mg. per 100 ml.)
4189	8	0·002	0·5	2·0	0·1	0·0125	0·1
4191	8	0·004	0·5	1·0	0·1	0·05	0·05
1	8	0·001	1·0	1·0	0·1	0·025	0·05
2	8	0·001	1·0	2·0	0·2	0·05	0·1
3	8	0·001	0·5	1·0	0·1	0·025	0·05
4	8	0·004	1·0	2·0	0·1	0·025	0·05
5	8	0·004	1·0	2·0	0·1	0·0125	0·05

Sulphonamides.

The seven strains of *A. lignièresi* were moderately sensitive to sulphanilamide, 1 to 2 mg. per 100 ml. inhibiting bacterial growth. They were very sensitive to sulphapyridine, sulphamezathine and sulphathiazole, the inhibiting concentrations being 0·1 to 0·2, 0·05 to 0·1 and 0·0125 to 0·05 mg. per 100 ml. respectively. Ditch-plate tests showed *A. lignièresi* to be more sensitive to the sulphonamides than the other bacteria tested.

Discussion

The results indicate that potassium iodide is without any appreciable lethal effect on *A. lignièresi* and that the curative action of this drug in such diseases as wooden tongue is not due to any direct effect on the bacteria themselves. Potassium iodide, therefore, although it may act in some other fashion, cannot be considered of specific value for *A. lignièresi* infection in the same way as the more modern therapeutic agents such as penicillin and the sulphonamides are considered specific for other diseases.

The evaluation of any drug in the treatment of *A. lignièresi* infection is necessarily a difficult one since the disease in cattle is usually sporadic, and it is not possible to produce a suitable experimental infection in laboratory animals. The natural infection may also be self-limiting since Magnusson (1928), who carried out an extensive investigation into this infection, pointed out that some animals recover without treatment. The oral administration of potassium iodide has often to be carried out for a considerable period of time before clinical improvement occurs, usually until signs of "iodism" are noted. On the other hand, some cases of wooden tongue are not affected by potassium iodide, but whether these are caused by other bacteria is not known. More rapid results have been claimed by the intravenous injection of one or two large doses of sodium iodide. The dose given (1 to 2 oz.) would not be sufficient to have a direct lethal effect on *A. lignièresi* present in the lesions as judged by the *in-vitro* tests and since sodium iodide is rapidly excreted it is difficult to compare its possible effect with that of administering a smaller dose *per os* once or twice daily for a considerable period of time. If the action of potassium iodide is due to the iodine radicle, it is a little difficult to understand, on theoretical grounds, why better results are sometimes claimed for the use of mercuric iodide since the amount of iodine present in the daily dose of mercuric iodide is very much less than when potassium iodide is prescribed. Mercuric iodide had a marked effect on *A. lignièresi in vitro*, but it is possible that this was associated with its mercury content. Even so, it is probable that the amount necessary to produce an inhibitory blood level would be toxic to the patient. It is obvious, therefore, that there are many aspects of the present treatment of *A. lignièresi* infection which cannot be explained adequately.

Turning to a consideration of the more modern therapeutic agents, it is noted that the *A. lignièresi* cultures were only slightly sensitive to penicillin. However, they were very sensitive to the sulphonamides, particularly sulphapyridine, sulphamezathine and sulphathiazole, at levels which could easily be obtained in cows by usual dosage (see Francis, 1949). These results suggest that the sulphonamides are worthy of extensive trial in the clinical treatment of *A. lignièresi* infection.

Summary

(1) The action of potassium iodide, mercuric iodide, penicillin, and four sulphonamides on seven cultures of *Actinobacillus lignièresi* was studied *in vitro*.

(2) Potassium iodide, but not mercuric iodide, was practically devoid of lethal action. The cultures were only slightly sensitive to penicillin. They were very sensitive to the action of the sulphonamides, particularly sulphapyridine, sulphamezathine and sulphathiazole. It is considered that these sulphonamides are worthy of trial in the treatment of *A. lignièresi* infection.

(Concluded at foot of next column)

Acknowledgment.—I am grateful to Messrs. C. G. Allen and R. V. Blamire for providing me with the clinical material from which five of the cultures of *A. lignièresi* were obtained.

References

Evans, R. J. (1948.) *J. Hyg., Camb.* **46**. 422.
Francis, J. (1949.) *J. comp. Path.* **59**. 245
Magnusson, H. (1928.) *Acta. path. microbiol. Scand.* **5**. 170.

BLOOD SPLASHING OF MEAT

BY

D. J. ANTHONY, M.R.C.V.S., D.V.S.M.,

Brierley Hill, Staffs

When the humane slaughtering controversy raged in Britain about 20 years ago, one of the chief objections raised to the mechanical stunning of animals prior to bleeding was the resultant blood splashing in the meat. Blood splashing is the name given to the blood extravasation found in the musculature and certain organs of the slaughtered animal, where that animal has been mechanically stunned. This rupture of the smaller blood vessels in the tissues, with the liberation of blood as unsightly smears, has been regarded as a type of lesion which accompanies mechanical stunning only, whether by electricity or captive bolt, and as being inseparable from such methods of humane slaughtering.

Splashing was regarded as objectionable because it resulted in the appearance of these unsightly spots of blood on the cut surface of the meat in the retail shop. The objection was said to come largely from the customer. It was also argued that as blood is a favourite medium for bacterial growth, therefore "splashed" meat was more likely to become decomposed, or "tainted," than meat taken from an animal killed without any mechanical stunning. Such views were held by people in the trade, and by others interested in these matters, in all sincerity, although the evidence may have been based upon reason rather than anything concrete.

Meat traders who interested themselves in these matters were prepared to adopt a stunning method, if they could be assured that no splashing of the meat would follow, and the introduction of the electric method of stunning to this country came through the trade, largely from the prompting of Sir Frederick Hobday. These stunning instruments have now been in use regularly in Britain for the stunning of pigs, sheep and calves, particularly in the American type "packing houses" in this country, where such methods were pioneered. Experience of their working has thus been gained on millions of animals during the last 15 to 20 years. Similar experience is available from many European countries. In the packing-house type of abattoir, speed in slaughter is of prime importance, as where animals are killed at the rate of some hundreds per hour

any delay in slaughter throws the whole day's programme out of gear.

It is the lack of violent reflex movement in the electrically stunned animal that has resulted in the speeding up of the rate of killing per hour, as compared with the days when pigs were hoisted by the hind leg and bled without any stunning. This enables the " shackler " to work with rapidity, and to hoist the pigs at a quicker rate than he would be capable of doing with unstunned animals. It also helps to decrease the time-gap between stunning and bleeding, and this is a most important point in reducing splashing.

In all the work done on electric stunning (and much of the recent work of Longley, for instance, is very valuable), it is obvious that a full appreciation of all the factors involved is not yet apparent to workers not engaged in the day-to-day routine of a mass-producing factory, or as the Americans call them, packing houses. In *The Veterinary Record* of April 21st, 1951 (Vol. **63**, No. 16), there appears a review of the Report of the Productivity Team who visited America from the British Meat Packaging and Processing Trade. In that review there is a paragraph which reveals the experience of at least one man under the pre-stunning era:—

> " . . . and it is amazing to note that 20 years after its introduction into common use in Britain, the electric stunner is not used in the U.S. Packing Houses to this day! (In some plants about 8,000 pigs are killed daily. Each animal is hoisted by means of a chain shackled to the hind leg. As the ' wheel ' takes the pig's weight off the floor and one pig follows another in rapid succession, *there is one long shriek lasting until the last of the 8,000 animals has bled to death.* Humane slaughtering methods seem to be comparatively unknown in the U.S.A. At least that is the impression one gets. . . .) In a country noted for its technical efficiency this absence of modern stunning methods is the one reproach we can level at the U.S. packing industry."

At the present time a controversy is raging in both the United States and Canada over the possibility of using mechanical stunning methods, particularly the electric stunner for the smaller animals. The arguments used against the introduction of these improvements, and in favour of retaining the present methods of hoisting and bleeding without stunning, are almost word for word those used over 20 years ago in Britain. In one case only have the American packers gone one better—they claim that electric stunning causes splashing to such an extent that the meat inspectors may not be able to distinguish the lesions caused by the stunner from those due to swine fever! This naive excuse refers in particular to the lungs and their associated lymph nodes, and it implies that veterinary surgeons either make their diagnosis on one lesion alone, or else that they are very ignorant of animal pathology!

Ignoring the speeding up of the killing rate made possible by the electric stunner, and the greater quantity of blood collected owing to the comparative lack of reflex movements, the opposition to the use of mechanical stunning in the slaughter of animals seems to be based chiefly on this problem of " splashing." Before considering whether splashing is really inseparable from mechanical stunning, it is well to clear our minds as to its importance to the meat trade as a whole. Many people like their fresh meat rather " bloody," and in the case of the freshly cut joint blood splashing often passes as a quite natural phenomenon. Here there is no question of " taint " formation, as the meat is for immediate sale and consumption once it is removed from the refrigerator. It is the " long-term preservation " kind of meat that needs to be watched for " splashing," both from the unsightliness of the cut surface, and from the fear of bacterial growth in the meat. About the only meat coming under this category is dry-cured bacon and ham. In Britain, since the Ministry of Food took control of the industry, this kind of cure is reserved purely for the individual with his " home-cured " pig meat, and for a small export trade in York hams. Most of the bacon consumed in the world is *not* of the " long-term preservation " kind. It is brine cured. The whole side, including shoulder and gammon or ham, is soaked in brine for about a week, dried, smoked (where necessary) and is ready for retail sale.

In the dry-cured bacon trade the meat is rubbed with dry salt repeatedly for about three weeks or a month, washed, dried, smoked, matured, and only then is it ready for retail sale. Even after sale it can be kept unconsumed for a long time provided certain elementary precautions are observed. The sides of bacon hanging on the kitchen beams were once a familiar sight here and the older generation needs no reminding of how such bacon would " keep " and " mature." It may thus be months after slaughter before this dry-cured meat is consumed. Anything which tends to harm this long-keeping quality is looked upon with alarm by the traders who deal in these products. Yet it is precisely this branch of the meat trade which introduced the electric stunner into this country, and which has had most experience of its use.

Splashing does not seem to have worried this branch, although they have more reason to worry about it than any other. The reason is that, as the result of past experience, we know that blood-splashing is not inseparable from mechanical stunning. *Splashing can be produced by the slaughterman in a stunned animal, should he wish to do so.* This is important to bear in mind when assessing the value of " slaughtering demonstrations " produced to impress the " lay " mind of the uselessness of electric or other methods of stunning.

It is the time lag between the acts of stunning and " sticking " or bleeding that determines the degree of splashing in the animal's carcase. If the slaughterman stuns an animal, whether by the electric method or by a captive bolt pistol, and almost simultaneously bleeds it, then the amount of splashing in the carcase and organs will be nil or so little as to pass unnoticed except by an expert. In hogs it is the lungs that show this slight trace of splashing in the form of pin-point haemorrhages along the dorsal borders of both organs. If the electric current is applied to the pig for an excessive length of time, then this lung-splashing will become more pronounced. The haemorrhages coalesce along the dorsal borders of the main lung lobes in particular. In sheep it is the diaphragm and heart muscles that are particularly affected. Lung tissue is of little or no value as an article of human food, nor is this slight splashing of such magnitude as to cause a meat inspector the slightest qualms. Millions of such lungs have been sold retail, as have sheeps' hearts and diaphragms, and in no case has the presence of a few pin-points of blood caused the customer the slightest perturbation. These again belong to the " fresh-meat " class.

I have already referred to the speed of killing being increased under electric stunning, and this naturally shortens the time factor between the acts of stunning and bleeding, so that we are left with a slaughtered carcase, killed in

(Concluded at foot of next column)

THE VETERINARY RECORD

October 27, 1951

THE ARMY VETERINARY AND REMOUNT SERVICES

ELSEWHERE in this issue reference is made to the improved rules governing promotion and rates of pay which now pertain to the Army Veterinary and Remount Services.

We are still convinced, however, that the great service rendered to the country by the officers and men of the Corps in two world wars has neither been realised nor appreciated. The work done by those officers who form a peace-time cadre and act as the spear-head of the Corps in any emergency is equally valuable. Thus while we welcome the improved prospects of promotion which put the R.A.V.C. on the same footing in that respect as the Royal Army Medical Corps and the Royal Army Dental Corps, it is a matter for considerable regret that the anomalies between the rates of pay of the R.A.V.C. Officer and those of his medical and dental colleagues have not been removed.

An officer of the Army Veterinary and Remount Services holds a responsible position. His concern is with the health of the animals in his charge and with that of Army personnel through the control of animal diseases communicable to man and the inspection of human food. His basic training is as arduous and exacting as that of his colleagues in the R.A.M.C. or R.A.D.C. and it is therefore difficult to understand why he should receive lower rates of pay than officers in those services. A Lieutenant R.A.V.C. receives 2s. a day less than a Medical Officer of similar rank and seniority. A Captain R.A.V.C. of three years seniority onwards is paid 6s. a day less than a Medical Officer and 3s. a day less than a Dental Officer. This means that during his first eleven years of service, an officer of the R.A.V.C. receives £1,013 less than a Medical Officer and £429 less than a Dental Officer.

The status of the officers of the R.A.V.C. is a matter which affects all the profession and they are our colleagues. The whole weight of the Association should be placed behind them in their demand for parity of pay.

---

silence; the blood from which has been collected in an efficient manner, and the musculature of which is as free of blemish as any butcher or the most pernickety customer could wish for.

To summarise:—

1. The importance of "splashing" can be over-emphasised in humane slaughtering controversy, as it does not necessarily follow that a stunned animal is a "splashed" one.

2. Splashing can be produced in varying degrees by increasing the time-lag between the acts of stunning and bleeding.

3. Splashing in pigs killed by bleeding after stunning by electricity is either absent, or confined to slight lung lesions.

4. Splashing is of paramount importance to the dry-cured bacon and ham trade, and this is the trade which first used electric stunning, and continues to do so.

THE GENERAL ELECTION

HISTORY is being made this week. During the past days we have listened to broadcasts, attended meetings, received canvassers, read manifestos and recorded our votes. To-day we know whether a change of government has taken place. As veterinary surgeons, we have our part to play as citizens and as members of no mean profession. What is to be our attitude to it all? Each one of us has views as to the methods he would employ so that peace may be preserved and the standard of living of his fellow men improved; the maintenance of the prestige of our country is dear to us all. It is as well that we take stock of the effect of the event upon us individually. Let us not be too jubilant not too downcast concerning the successes and failures now revealed. Let us rather have sober thoughts and bend our wills towards the tasks which confront us. Each party has its ideals; do not scorn the ideals of opponents. Bitterness leads nowhere: could we but view the future scene we should observe the present with academic calm and balanced judgment. The study of to-day would, in more distant times, lead to a wise handling of our present problems. Let us, therefore, pray that wisdom, guidance and strength be given to the government which we have elected.

LEGAL NOTES

Wrongful Use of Title "Veterinary Practitioner"

In its issue of October 9th the *Derby Evening Telegraph* reports that, at Ripley on the previous day, Miss Eleanor Jane Watson, of Snowdrop Valley Kennels, Crich, was fined £1 for using the title of "veterinary practitioner" and £1 for practising veterinary surgery while not being registered as a veterinary surgeon, at Heage, between March 21st and April 7th. She was ordered to pay 35s. costs and £3 3s. advocate's fee.

Miss Watson, who told the court that she had attended animals for 19 years, pleaded "Not guilty."

Mr. T. Wilson, prosecuting for the Royal College of Veterinary Surgeons, said that the offences arose from the 1948 Act, which prevented people not registered as qualified veterinary surgeons or not included in the Supplementary List from styling themselves as veterinary practitioners and from practising surgery.

He said that a fox terrier owned by Mr. William Bowler, of "Ash Leigh," Ripley Road, Ambergate, was injured by a bus. Mr. Bowler sent for Miss Watson, whom he thought was a veterinary surgeon. She treated the animal for leg injuries. She put the injured limb in splints and plaster, added Mr. Wilson, and altogether made five visits in three weeks. On the last visit she said that the animal was all right and left a bill for £2 2s., styling herself as E. J. Watson, veterinary practitioner.

Mr. Bowler was not satisfied with the dog's condition and eventually the facts came to the notice of the R.C.V.S., who ordered proceedings to be taken against Miss Watson.

Mr. R. S. D. Cash, defending, pointed out that people not registered with the R.C.V.S. were still allowed under the Act to do certain veterinary work, including first aid. Miss Watson made application to the College to be included in the Supplementary List, but it was refused because she had not been engaged solely on veterinary work for ten years as laid down in the Act. Miss Watson thought she could safely describe herself as a veterinary practitioner, but unfortunately she could not have chosen a worse title. "She tenders apologies to the College and undertakes never to use the title again," stated Mr. Cash.

* * * *

ZOOLOGICAL SOCIETY'S GOLD MEDAL AWARD

The gold medal of the Zoological Society has been presented to Mr. Alfred Ezra for 36 years' service on the Council and for outstanding donations, states the Society. Since Mr. Ezra became a Fellow of the Society in 1909 scarcely a year has passed in which he has not presented some animals to the Society's collection. He has also given his expert advice and assistance in many other directions. The gold medal of the Society has previously been awarded only four times.

CLINICAL COMMUNICATION

THE PROBLEM OF THE DISPLACED EPIPHYSIS

N. ROBERT TURNBULL, F.R.C.V.S.,
BASINGSTOKE

A common injury in young dogs and, to a lesser extent, in cats is the separation of the distal epiphysis of the femur. The injury usually results from some direct violence such as occurs in road accidents, and produces a crippling deformity in the limb. The degree of displacement varies widely from a slight backward rotation of the epiphysis to a displacement of several inches up the shaft of the femur. The condition is almost impossible to correct without open reduction, and in cases where healing occurs without adequate reduction complete extension of the limb is impossible owing to the loss of the fulcrum effect of the patella on its articulation. In the majority of such cases the limb is permanently flexed and, if used at all, produces a pronounced limp. The normal position of the epiphysis should be compared with the abnormal radiologically, when the causes of the deformity will become obvious.

Methods of Fixation—Dogs

A. *Exposure of the Fracture.*

The incision extends from the mid shaft of the femur following the curve of the leg down to the antero-lateral aspect of the mid-tibial region. The subcutaneous fascia and the fascia lata is incised, and the fracture line exposed by blunt dissection between the vasti muscles. The distal fragment may be displaced as much as halfway up the shaft of the femur. Properly to expose the distal fragment it may be necessary to incise the fibrous aponeurosis of the insertion of the quadriceps muscles, and to open the femoro-patella joint. Then by flexing the stifle joint and rotating the lower end of the tibia outwards, the fractured surface of the femoral epiphysis is brought into view. A reduction can be carried out by traction or by leverage with some flat instrument such as a scalpel handle.

B. *Use of Plates and Screws.*

Dr. Moltzen Neilsen, of Copenhagen, has described the use of screws and Lane's (or Sherman) plates in this condition (*Veterinary Record*. **61.** 791) with excellent results, but these techniques are difficult, particularly in the smaller subjects.

C. *Use of Wires.*

In 1945 and 1946 the author attempted fixation of this condition by the use of stainless steel wire sutures. In one case quite a good result was obtained, but the position was considered to be far from perfect and further cases showed the technique was difficult and, on the whole, results were not satisfactory.

D. *External Pins.*

The author, having acquired an American Army pattern of mandible fracture repair outfit, on the same principle as the Kirschner-Ehmer splint, so widely used in the U.S.A., experimented with a femur from a cadaver and found that a separation just above the condyles could be firmly fixed, as shown in Fig. 1.

The technique was tried on a case kindly provided by Mr. Ticehurst, M.R.C.V.S., of Maidenhead. The exposure was as described above, and the pins were placed in position by direct vision before reduction. The locking bars were all connected up loosely, reduction effected, and the locking bars tightened up. The operation site was insufflated with penicillin and sulphamezathine powder, and the skin sutured around the pins. Recovery was uninterrupted and the functional result very good. The result of this case and the relatively easy technique compared with screws, plates or wires give reason to believe this to be the method of choice in dogs.

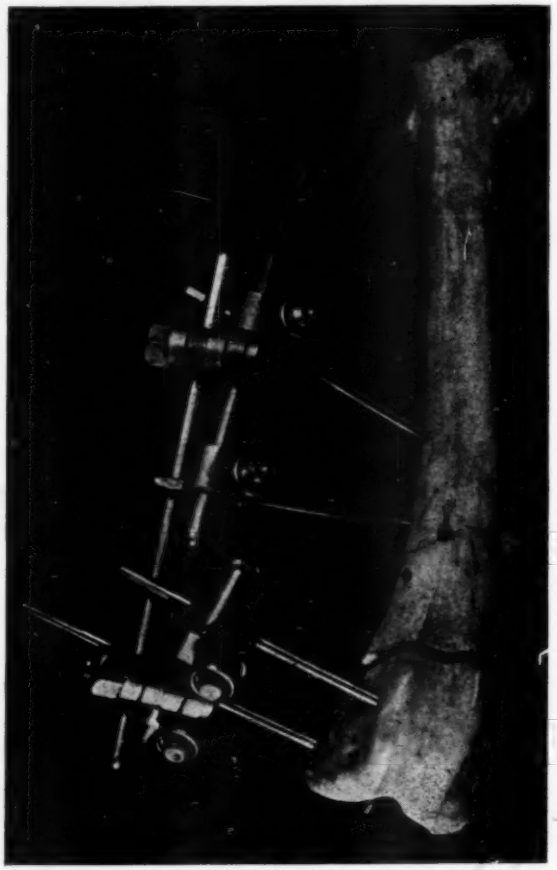


Fig. 1.

Cats

Cats present a slightly different problem as the femoral epiphysis is relatively small, and such an appliance as described above is somewhat bulky for such a delicately adjusted animal. The femur of the cat, unlike that of the dog, has a perfectly straight shaft, and this fact led the author, in the only case he has had in a cat, to pass an intramedullary pin of his own design right down the shaft of the femur and through the epiphysis which had been openly reduced by direct vision. The pin traversed the stifle joint and could be felt subcutaneously. After the removal of the pin in three weeks the leg was used well, but with a slight limp due to the imperfect position of the displaced epiphysis, which was rotated on the end of the femoral shaft causing the hock to swing inwards.

Conclusion

These few observations are submitted in the hope that they will confirm the findings of those who have tried and succeeded, will encourage those who had tried and failed, and will stimulate those who have not yet tried open methods of orthopaedic surgery.

ABSTRACTS

Pathology of Necrobacillosis of the Bovine Foot*

The authors define necrobacillosis of the bovine foot as "a necrotising infection of the tissues immediately proximal to the coronary band or of the interdigital tissues, often complicated by arthritis of the coffin joint and caused, in part, by *A. necrophorus* penetrating from the surface." They examined 116 feet [61 per cent. hind feet] for gross and microscopic changes but did not make bacteriological examinations. Flint and Jenson classify the changes present in one or more of the following groups: dermatitis, necrosis of the interdigital tissue, arthritis of the coffin joint, osteitis, laminitis, inflammation of connective tissue, arthritis of pastern and fetlock joints and miscellaneous. The pathogenesis of the natural cases is discussed briefly.

Lesions were successfully reproduced by the inoculation of living *A. necrophorus* into the left common digital artery of eight calves. The experimental disease was widely disseminated in the joints, bones, connective tissue and skin. A constant feature was the presence of an acute fibrinopurulent arthritis of the coffin joint. There were no visceral lesions.

A. R. J.

* **The Pathology of Necrobacillosis of the Bovine Foot.** Flint J. C., & Jensen, R. (1951.) *Amer. J. vet. Res.* **12.** 5.

* * * * *

Infectious Canine Hepatitis*

Smith reviews the clinical symptoms and the gross and microscopic pathology of 18 natural cases of Rubarth's disease. Jaundice was not present in any of these cases. Following suggestions that anthelmintic treatment might have a "provocative effect" on the disease, experiments were designed to determine the effect of the administration of tetrachloroethylene on the course of experimentally induced infectious canine hepatitis.

Seventeen dogs between the ages of two to four months were infected with material from four different sources. None of the dogs died from the disease during the experiment but five of them were destroyed in order to check the infectivity of the inoculum used. It is claimed that all the dogs responded to infection since there was a rise in temperature and a leucopenia. The leucopenia was due to a lymphopenia which commenced one to five days after infection.

The author concludes that infectious canine hepatitis is an important disease in Canada and that he could obtain no evidence of a cataphylactic effect with tetrachloroethylene. He suggests that the presence of a leucopenia might be of some value in diagnosis.

A. R. J.

* **Observations on Infectious Canine Hepatitis.** Smith, D. L. T. (1951.) *Amer. J. vet. Res.* **42.** 38–43.

To house the Royal Society and 15 other scientific societies, the London County Council are negotiating for the acquisition of a site on the south bank of the Thames immediately beyond Waterloo Bridge, part of the Festival ground. Other buildings would house Government scientific organisations, including the Patent Office and its library, which would be extended.

ROYAL ARMY VETERINARY CORPS

1. New Rates of Pay and Conditions of Promotion for Regular and Short Service Commissioned Veterinary Officers of the Royal Army Veterinary Corps have just been announced. These date back to September 1st, 1950. A comparative table of the old and new daily rates is set out below:—

	Old	New
	£ s. d.	£ s. d.
Lieutenant on appointment	1 0 0	1 4 6
Captain	1 2 0	1 9 0
„ after two years as such	1 5 0	1 11 0
„ „ three „ „ „	1 5 0	1 12 0
„ „ four „ „ „	1 8 0	1 15 0
„ „ six „ „ „	1 11 0	1 18 0
Major	1 17 0	2 4 0
„ after two years as such	2 0 0	2 7 0
„ „ four „ „ „	2 3 0	2 10 0
„ „ six „ „ „	2 6 0	2 13 0
Lieutenant-Colonel	2 12 0	3 0 0
„ after two years as such	2 15 0	3 3 0
„ „ four „ „ „	2 18 0	3 6 0
„ „ six „ „ „	3 1 0	3 9 0
„ „ eight „ „ „	3 4 0	3 12 0
Colonel	3 9 0	3 19 0
„ after two years as such	3 12 0	4 2 0
„ „ four „ „ „	3 15 0	4 5 0
„ „ six „ „ „	3 18 0	4 8 0
Brigadier	4 1 0	4 11 0

Promotion to Captain and Major is now after one and eight years service as a Veterinary Officer.

The new rates of pay also apply to National Service Officers after 18 months Service.

2. In addition, the following allowances are payable where applicable:

(a) Lodging Allowance:—
Majors, Captains and Lieutenants ... 11s. 0d. per day
Colonels and Lieutenant-Colonels ... 14s. 0d. „ „
Brigadiers ... ... 17s. 0d. „ „

(b) Marriage Allowance:—
(i) Regular and Short Service Commissioned Officers over 25 years of age:
Majors, Captains and Lieutenants ... 18s. 6d. per day
Colonels and Lieutenant-Colonels ... 21s. 0d. „ „
Brigadiers ... ... 23s. 6d. „ „
These rates are 3s. per day less when public accommodation is provided for the officer's family.
(ii) National Service Officers over 25 years of age:—
Majors, Captains and Lieutenants ... 12s. 6d. per day
(iii) Regular and Short Service Commissioned Officers under 25 years of age:
All ranks ... ... 56s. 0d. per week
(iv) National Service Officers under 25 years of age:
All ranks ... ... 45s. 0d. per week

(c) Ration Allowance—when not fed in Mess (*e.g.*, on leave, lodging list or married and living with family):
All ranks ... ... 3s. 4d. per day

(d) Outfit Allowance is also admissible on first commissioning; the following rates apply:
Short Service Commissions £140
National Service Commissions £85
An Income Tax Allowance of £30 per year is also made by the Commissioners of Inland Revenue as a deduction from Taxable Income.

3. For Commissions as Veterinary Officers, candidates must be Members of the Royal College of Veterinary Surgeons under the age of 42 years. All applications and requests for further information should be addressed to the Under Secretary of State, The War Office (V & R), Droitwich, Worcestershire.

Applicants will be required to attend at the address given above for interview. Approved applicants will be granted Short Service Commissions for a period of eight years, two to eight years of which may be spent on the Active List and the balance in the Regular Army Reserve of Officers.

Candidates liable for National Service who apply for a Short Service Commission are required to serve a minimum of four years on the Active List.

The following gratuities are payable to holders of Short Service Commissions:

For two years on the Active List	£200
For three years on the Active List	£375
For each completed year over three years on the active list	£125

An Officer holding a Short Service Commission will be considered for appointment to a permanent commission after a period of service approved by the Army Council.

QUESTIONS AND ANSWERS

The submission of questions for inclusion in this column will be welcomed; they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address. It is regretted that consideration cannot be given to questions for which solely a private reply is required.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Bloodless Castration of Horses

Q. 400.—*Has bloodless castration (Burdizzo method) been used to any extent in horses? There would appear to be many advantages in using this technique—what are the objections?*

A.—Burdizzo in his booklet describes the operation in the camel (*Vet. Rec.* July 13th, 1929) and states that the same procedure is adopted for the horse. This rather indicates that the method is not commonly used for horses.

There are objections to the method. The racing authorities in this country would not accept a horse as a gelding if it had been castrated in this way.

The animal has to be cast, which is a serious objection. It is a great advantage if an operation on the horse can be performed satisfactorily whilst the animal is on his feet.

A lapse of time is necessary before one can be certain that the animal is sterile.

The difficulty of grasping the cord can be overcome by local infiltration of anaesthetic, but this adds to the time that the animal has to remain cast.

The castrated horse with vestigial testicles would be looked upon with suspicion.

The possibility of the operation not having been performed satisfactorily and the intensification of the unpleasant male characteristics cannot be overlooked.

. . . . . .

Wind-sucking and Crib-biting

Q. 401.—*Is there any known operation for the cure of wind-sucking or crib-biting in a two-year-old thoroughbred filly? Presumably it would be a tenotomy.*

A. (1)—Forssell devised an operation for crib-biting horses; for details see the undermentioned reference. The operation entails the removal of portions of the sterno-cephalic, omo-hyoid and sterno-thyro-hyoid muscles through a mid-line skin incision extending from the body of the hyoid bone to the middle of the neck, approximately 18 inches in length.

Tenotomy of the sterno-cephalic tendons, simple myotomy of the sterno-thyro-hyoid muscles, neurectomy of the ventral branches of the eleventh cranial nerves supplying the sterno-cephalic muscles, have all been tried and found of little use.

Reference: MITCHELL, W. M. (1927), "Forssell's operation for the cure of Crib-biting," *Vet. Rec.* **7.** (N.S.), 683-5.

A. (2).—The respondent regards operative interference, such as Forssell's operation, as drastic procedure to adopt on a two-year-old thoroughbred filly. Personally in such a young animal he would try some simple remedy first, such as tacking sheep skin on those places where the filly can take hold, or fitting a "crib-biting" throat band or collar, or both.

. . . . . .

Car Sickness in Dogs

Sir,—In re-reading the June 2nd issue of *The Veterinary Record* I noticed Question 393 about car sickness in dogs. In my practice I have found the best results with a new drug called dramamine [manufactured by Searle and Co., of Chicago, Ill.]. Dosage is 50 mg. for 25 lb. bodyweight. Given half to one hour before travelling, some dogs show a slight sedative effect which is not objectionable for the pet dog and is in no way sufficient to interfere with an animal at a dog show.

I do not know if this drug is available in England, but thought that your enquirer might be interested.—Yours faithfully, IRENE KRAFT, Veterinarian, 909, North Broadway, White Plains, N.Y., U.S.A. *September 6th*, 1951.

[Dramamine is not at present generally available in this country. —*Editor.*]

THE HORSE ON THE MODERN FARM

The position occupied by the horse on the modern farm is discussed in a recent survey by Mr. J. H. Evans, of the Economics Department at Nottingham University. The decline in the working horse population to almost half its number since 1939 has been accompanied by a rise in the percentage of older animals, indicating a decrease in the numbers for replacements. Slaughter for meat has still further reduced the number of young horses now available.

A nationally important consequence of the change from animal to mechanical power is the release for food production of land formerly feeding horses. It is estimated that 750,000 acres have been so released—equivalent to the area lost to agriculture over the same period for non-agricultural purposes.

Horses' Advantages

Among the advantages of employing horses is the divisibility of the power unit, for the ordinary farm tractor is an indivisible unit of about 20 h.p. Besides the fact that many jobs do not require all this power, the separate horse units may be employed on different tasks at the same time—an important factor at harvest or other busy times, when the labour team will not be constantly employed if carting is irregular.

Horses can sometimes be used on land too wet to take the weight of a tractor, both for spring cultivations and for carting roots in winter. They can readily perform short journeys which involve constant stopping and starting, and are able to exert a pull of up to 10 h.p. for a few seconds over a short distance. Nevertheless horses are rapidly being displaced, even for carting—their last important sphere of activity on the farm.

The average cost of keeping 34 horses in 1949-50 was just over £26 each—the cost of an hour's work being one shilling. Low costs per hour were only obtained where the horses worked more than 600 hours a year. Despite their low maintenance costs (of about £16 a year) six of the horses together performed only 460 hours' work, and it is difficult to justify keeping such a team when the working cost per hour is considered.

Shoeing Facilities

Difficulties facing farmers who wish to retain a few horses are the lack of shoeing facilities and of skilled horsemen. It is not easy to decide what tasks should be allotted to horse labour in order to obtain full employment for them, especially as duplication of horse and tractor implements may be involved. Where two horses and their equipment can replace a tractor, however, it may be possible to form an economic unit, and on such an arrangement the future of the farm horse will depend.—*Farmers' Weekly.*

* * * * *

It was announced at a council meeting of the Royal Agricultural Society that the inter-county dairy herds trophy, given each year by Lord Bledisloe to encourage the elimination of tuberculosis among dairy cattle, will in future be based on attested herds only.

MEMORIAL PORTRAIT-IN-OILS OF DR. FRED BULLOCK

Unveiling by the President at the Royal College of Veterinary Surgeons

At noon on Friday, October 12th, 1951, the proceedings of the Council of the Royal College of Veterinary Surgeons were adjourned while in an adjacent upper room the simple, moving ceremony took place of the unveiling by the President, Professor J. G. Wright, F.R.C.V.S., of the sensitive, posthumous portrait-in-oils, by Mr. Arnold Mason, R.A., of Fred Bullock, LL.D., Barrister-at-Law, Secretary and Registrar 1907-1946, which henceforth will adorn the walls of the college.

Mrs. Bullock, Mr. Wilfrid Bullock (son) and his son Wilfrid Denys, accompanied by close friends of the family in Mrs. C. W. Francis, Mrs. Davies, wife of Mr. Edmund Davies, K.C., and Mr. P. N. S. Farrell were present, as was also the artist. Numerous other visitors, mainly members of the profession, united with the President, the immediate Past-President (Sir Thomas Dalling), and Councillors, Mr. Oates (Dr. Bullock's successor), Mr. Francis, the Assistant Secretary, and Mr. Knight, General Secretary N.V.M.A. (formerly assistant to Dr. Bullock) in the proceedings accompanying this acquirement by the College of a life-like, enduring memorial to a loved and honoured officer who, though not *de jure* one of the profession, made himself, through his devotion to the advancement of the corporate body and the welfare of the members, its very personification.

There is no need of further introductory words, for all that was in the minds and hearts of those present was finely expressed by the President, who, when the company had assembled, explained that the portrait was the outcome of a public subscription initiated by the College during the Presidency of Mr. Howard Dawes. "We are most happy," he continued, "to have with us to-day Mrs. Bullock, their son Mr. Wilfrid Bullock, and a further generation in Wilfrid Bullock."

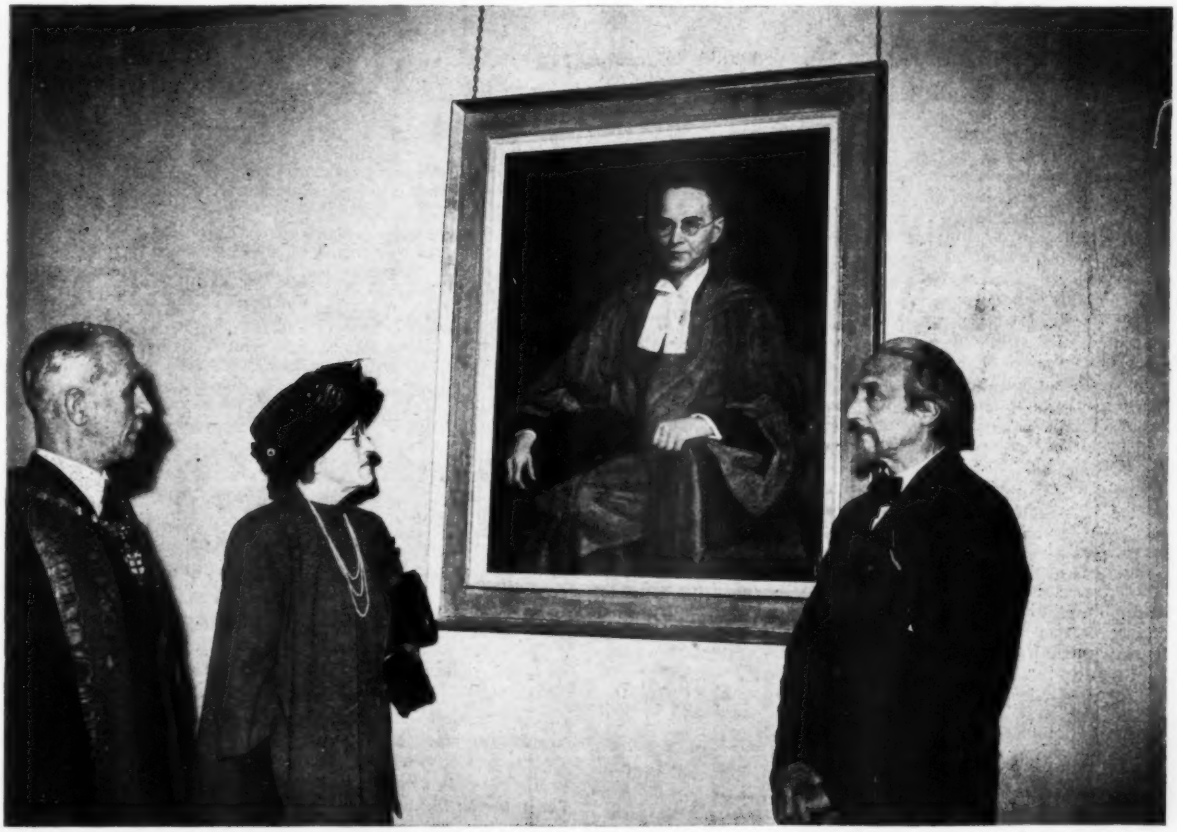
The portrait was then unveiled.

"Dr. Bullock was a Staffordshire man," the President recalled. "After his boyhood education at home, he proceeded to the University of Caen, in Normandy, where he acquired a great love of the French language and literature. He returned to England and became an educationalist in his native county of Staffordshire.

"In 1907, at the age of 28, he was appointed Secretary and Registrar of this Royal College of Veterinary Surgeons, and he continued to serve it in that capacity for 40 years—a period of great loyalty and great devotion to our interests. He brought wisdom to our counsels, and by the very great honour and distinction which he, as a man, attained, we were able to bask in the reflected light which came from his distinctions.

"He was a man of great mental capacity, and he was a man of great energy. His duties at this Royal College were not sufficient to fill that great mind, for he was a scholar seeking knowledge. We find that in 1930 he prepared a treatise on one of the French West African Colonies, the Ivory Coast. By his researches into original documents, he was able to show that the general views held in France regarding the origin of that Colony were in fact wrong.

"In 1923 we find him a student of law in the University of London and reading for the Bar. In 1926 he obtained the degree



Left to Right: Professor J. G. Wright, President of the Royal College, Mrs. Bullock, and Mr. Arnold Mason, R.A., the artist.

of Bachelor of Law of the University of London, and in the same year he was called to the Bar at Gray's Inn. But not being content he now makes legal affairs the object of his researches, for two years later he presents a thesis on the law relating to the practice of medicine, dental surgery and veterinary surgery. For this he became a Doctor of Law of the University of London.

"I think that that work was his *magnum opus*. But he continued with many other writings.

"About this time, many of you will recall, he became associated with the late Sir Frederick Smith, who had taken upon himself the colossal task of researches in the archives in the preparation of his history of veterinary literature. In this matter Dr. Bullock was a great and a constant help to him; Dr. Bullock was largely responsible for the searching of the continental archives.

"It is appropriate at this point that I should say that he was fortunate in his intellectual pursuits in having the great help of his wife, Mrs. Bullock, for she also is a scholar of distinction.

"Dr. Bullock was a linguist. He had a deep knowledge of Latin. He was fluent in French and German, and in fact there were few European languages around which he could not find his way. Some in this room will remember the 1930 International Veterinary Congress, of which Dr. Bullock was the General Secretary. You will recall the great delight which he gave the French delegates when he addressed them fluently in their own language.

"Not only was Dr. Bullock a man of great intellect; he was a very kindly, sensitive creature. There are few in this room who have not received kindness from the hand of Dr. Bullock, at some stage in their lives. Particularly was he kind to young men. Dr. Bullock was able to understand the hopes and the fears of young men, for he was a young man in mind throughout his life.

"That is the manner of the man whom we are honouring this morning.

"In 1939 Dr. Bullock was 62 years of age. It was reasonable and proper to think that he might now expect to relax a little, that he might take a little leisure to bask in the sunshine of his scholarship and attainment. But that was not to be. There came the war, and with it the tremendous upheavals which war entailed. He had the enormous task of evacuating the College to Harrogate. His home was uprooted; the finding of alternative accommodation was extremely difficult. Staffing problems became greater and greater, and his College demands became more and more onerous. The conduct of our examinations became increasingly difficult. We were at this time meeting the impact of the Loveday Report, which gave Dr. Bullock an enormous amount of work. He had to do with his own hands many of the things which ordinarily he could have deputed to his clerks.

"Shortly after the return of the College to London, he died. Of no man could it be more truly said that he died in harness. At the time of his death he was shouldering a burden which might have caused a stronger man to stagger and to fall. Mrs. Bullock, Mr. Wilfrid Bullock—we are happy and sincerely privileged that this portrait should hang in this Royal College which he served so well and so long. The fact that it hangs on the wall of the room in which, for long periods, he worked will be to you a source of joy and pride.

"We are privileged also to have here the artist, Mr. Arnold Mason. Sir, none of us would presume to be art critics, but we think we are able to appreciate an object of great artistic merit when we see it, and that is how we regard this picture. I understand that you did not know Dr. Bullock in life. I can assure you that by your skill and talent you have produced for us an image which is life-like (hear, hear). It is to us an object of great pleasure and deep satisfaction.

"The memory of Fred Bullock will always live as long as this College lives, but the presence of this portrait will make that memory ever more real and more vivid." (Applause.)

In response to the invitation of the President, who asked whether Mrs. Bullock or Mr. Wilfrid Bullock would like to say a few words, Mr. Wilfrid Bullock said:

"My mother has asked me to speak for her because she finds it extremely difficult to bring herself to speak at all. She, more than anyone, has never been able to get over the great loss which she feels, and it would be extremely affecting for her to try to thank the Royal College and to thank the President for the very kind words which he has said this morning.

"It would be presumptuous of me to attempt to express in words what we feel. I know that my father could have expressed it far better than I can hope to do, but I would like to say that this enduring memorial, which will hang on these walls of the Royal College which for 40 years was his life, is something which affects us very much. We as a family are extremely proud. I have to-day brought my elder son to see this portrait, and when we are in London we shall come and look at it with pride, and think with affection of the College which made this possible."

With these words, spoken with emotion, the ceremony came to an end.

NOTES AND NEWS

Diary of Events

Oct. 29th.—Meeting of the West of Scotland Division, N.V.M.A., Clinical Club at the Glasgow Veterinary School, 7.30 p.m.

Oct. 31st.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Grantham (The George Hotel), 2.15 p.m.

Oct. 31st.—Meeting of the Scottish Metropolitan Division, N.V.M.A., at the Royal (Dick) School of Veterinary Studies, 2.30 p.m.

Nov. 1st.—Meeting of the Central Division, N.V.M.A., at the Royal Veterinary College, N.W.1, 6 p.m.

Nov. 2nd.—Autumn Meeting of the Eastern Counties Division, N.V.M.A., at Bury St. Edmunds, 10.30 a.m. (See Notice.)

Nov. 6th.—Meeting of the East Midlands Division, N.V.M.A., at Sutton Bonington, 2.15 p.m.

Nov. 7th.—Midland Counties Division, N.V.M.A., Dinner-Dance-Cabaret at Birmingham (Midland Hotel), 7.30 p.m.

Nov. 30th.—North Wales Division, N.V.M.A., Dinner-Dance at Llandudno (St. George's Hotel), 7.30 p.m.

N.V.M.A. Committees and Council

The following dates have been arranged for the next meetings of Committees and Council, to be held in London, the Committees at 36, Gordon Square:—

Wednesday, November 7th
2.0 p.m. Veterinary State Medicine Committee.
4.0 p.m. Parliamentary and Public Relations Committee.

Thursday, November 8th
10.0 a.m. Organising Committee.
12.0 noon. Home Appointments Committee.
2.15 p.m. General Purposes and Finance Committee.

Friday, November 9th
11.0 a.m. Council Meeting.

. . . . . .

R.C.V.S. EXAMINATIONS

Friday, November 2nd.—Pharmacology, etc., Examination (Revised Syllabus) Written Examination.

Tuesday, November 6th.—Pharmacology, etc. (Revised Syllabus) Orals and Practicals commence.

Thursday, November 8th.—Animal Management Examination tour commences at London.

Thursday, November 29th.—M.R.C.V.S. Written Examinations.

Friday, November 30th.—Ditto.

* * * * *

ROAD AND RAIL TRAFFIC ACT (EXEMPTION) REGULATIONS, 1951

Veterinary Surgeons' Utility Vehicles and Trailers

Under the Road and Rail Traffic Act, 1933, it is laid down that a goods vehicle shall not be used for the carriage of goods for hire or reward or in connection with a trade or business except under a carrier's licence. The definition of "goods vehicle" was important to various professions and under the Road and Rail Traffic Act (Exemption) Regulations, 1938, certain exemptions were granted.

However, after consultation with the Royal College of Veterinary Surgeons the Minister of Transport has now issued new exemption regulations of which two have a direct bearing on the vehicles of the veterinary profession. It is, therefore, unnecessary for a veterinary surgeon to obtain a carrier's licence in the following instances:

(i) The use by a medical practitioner, nurse, midwife, dentist or veterinary surgeon of a vehicle for the carriage of medicines, instruments or apparatus (Regulation 2(n));

(ii) The use of passenger vehicles with seats for not more than seven passengers, excluding the driver, when adapted to draw or drawing a trailer if neither the trailer nor any goods carried in it are carried for hire or reward (Regulation 2(o)).

* * * * *

PERSONAL

Dr. J. R. M. Innes' Study of Disseminated Sclerosis

Dr. Innes writes to say that following the termination of his Fellowship at the National Institutes of Health in Washington in June last, he is now on the staff of the Foundation of Applied Research, San Antonio, his appointment there having been sponsored by the Multiple Sclerosis Society of New York. He is studying the problems of disseminated sclerosis with special reference to its aetiology and is attempting (*a*) to follow up the theory outlined in his recent article in the *British Veterinary Journal* as to the possible significance of filarial worms as a causative factor and (*b*) to identify a virus or other infectious agent as a cause of the condition.

* * * * *

Birth.—Scott.—On October 16th, 1951, at the Princess Elizabeth Hospital, Nairobi, Kenya, to Joan (*née* Walker), wife of Gordon R. Scott, B.Sc., M.R.C.V.S., a daughter—Mary Ann.

. . . . .

Marriage.—Bateson—Griffey.—On September 28th, 1951, at St. Matthias' Parish Church, Ilsham, William Brian Bateson, M.R.C.V.S., to Jean Griffey, S.R.N.

. . . . .

Forthcoming Marriages.—Archard—Wright.—The engagement is announced between Mellis V. Archard, younger son of the late Mr. V. S. Archard and of Mrs. W. Archard, Fairclose House, Whitchurch, Hants, and Margaret V. Wright, M.S.R., younger daughter of the late Mr. G. L. Wright and of Mrs. I. F. Wright, Hoveton House, Ashtead Park, Surrey.

Hunt—Harvell.—The engagement is announced between Duncan Kenneth Hunt, M.R.C.V.S., youngest son of Mrs. A. L. Hunt and the late W. A. Hunt, Esq., of Keyhewen House, Milford-on-Sea, Nr. Lymington, and Miss Mollie Hilda Harvell, youngest daughter of Mrs. L. E. Harvell and the late E. S. G. Harvell, Esq., The Old Bank House, Lymington, Hants.

* * * * *

R.C.V.S. OBITUARY

Kernohan, John, Broughshane Street, Ballymena, Co. Antrim. Graduated Glasgow, April 19th, 1887. Died October 13th, 1951; aged 90 years.

Mr. John Kernohan, M.R.C.V.S.

Mr. John Kernohan, whose death we report above with much regret, was well known as a veterinary surgeon and judge at agricultural shows. He had not appeared much in public during the past two years owing to illness.

A native of Cullybackey, Mr. Kernohan qualified in Glasgow, and he and his brother, the late Mr. Robert Kernohan, M.R.C.V.S., went into partnership. They exhibited horses at all the leading shows and Mr. John Kernohan was a prominent figure in the jumping enclosure. He was a foundation member of the County Antrim Agricultural Association, an hon. member of the Royal Dublin Society, and was also a founder of the Mid-Antrim Hunt.

Mr. Kernohan was unmarried. He was a member of Cuningham Memorial Presbyterian Church, Cullybackey.

* * * * *

DR. MAX THEILER AWARDED NOBEL PRIZE

Research on Tropical Diseases

At Stockholm on October 18th the Nobel Prize for Medicine for 1951 was awarded to Dr. Max Theiler, of the Rockefeller Foundation, New York, for his development of the first effective vaccines against yellow fever. Dr. Theiler, who is 51, has been with the international health division of the foundation since 1930, conducting research on tropical diseases, especially yellow fever.

Dr. Max Theiler is the second son of the late Sir Arnold Theiler, the Director of Veterinary Services, South Africa, and the founder of the Onderstepoort Veterinary Research Laboratories. We hope to make fuller reference to this important award in an early issue.

CONSERVATION OF NATURE RESERVES

A technical conference held at The Hague by the International Union for the Protection of Nature was attended by about 120 people drawn from 12 countries, reports *The Times*. They discussed matters connected with the rural landscape as a habitat for flora and fauna in densely populated countries, and with the management of nature reserves.

Among the conclusions and resolutions was one recommending that, in view of the large scope of the projects being undertaken on the world's surface by technicians unaware of problems of nature protection, special courses in the conservation of environment should be given at all engineering and technical schools.

Attention was also drawn to the effects of large hydro-electric dams on natural hydrography, in particular the drying up of rivers, alteration of the water-table, and diversion of waters into different basins. It was urged that water pollution, by land and sea, and water conservation should be studied internationally.

* * * * *

ADDRESSES OF DISEASE-INFECTED PREMISES

List Showing the Outbreaks of Notifiable Diseases (Other than Tuberculosis) Confirmed on the Undermentioned Dates

Together With

Address of premises on which disease occurred and, in capital letters, the name of the Local Authority concerned.

Anthrax

October 12th, 1951.—Smeaton Wood Farm, Wrenbury, Nantwich, Cheshire (Cheshire).

October 17th, 1951.—Kessington Farm, Bearsden, Glasgow (Dunbartonshire); Eaglethorpe Farm, Warmington, Peterborough, Northants (Carcase at: Gravel Pits Field, Warmington, Peterborough, Northants) (Northamptonshire).

Fowl Pest

October 12th, 1951.—Ravenskerne, Pine Avenue, Little Hoole, Preston, Lancs (Lancashire).

October 15th, 1951.—Stratheyre, Pine Avenue, Little Hoole, Preston, Lancs (Lancashire).

October 16th, 1951.—Ravenscroft, Much Hoole, Preston, Lancs (Lancashire); Home Farm, Rydens Road, Walton-on-Thames, Surrey (Surrey).

October 17th, 1951.—Lynwood, Pine Avenue, Little Hoole, Preston, Lancs (Lancashire); Marsh Cottages, Clifton, Preston, Lancs (Lancashire); Broadvale, Moss House Lane, Much Hoole, Preston, Lancs (Lancashire); Johnson Farm, Johnson Lane, Tarleton, Preston, Lancs (Lancashire).

October 18th, 1951.—Mayfield, Hall Lane, Longton, Preston, Lancs (Lancashire); Norfolk House, Hall Lane, Longton, Preston, Lancs (Lancashire).

Swine Fever

October 12th, 1951.—Moor Barns Farm, Coton, Cambridge (Cambridgeshire); Moat Farm, Birdbrook, Halstead, Essex (Essex); Barville Farm, Tilmanstone, Sandwich, Kent (Kent); The Piggeries, Sutton Road, Leverington, Wisbech, Cambs (Isle of Ely); Gilmour House, Old House Lane, Marton, Blackpool, Lancs (Lancashire); 28, North Street, Crowland, Peterborough, Northants (Lincoln Parts of Holland); Kingscliffe Road, Easton-on-the-Hill, Stamford, Lincs (Northamptonshire); 114, Church Street, Church Gresley, Burton-on-Trent, Staffs (Derbyshire); White Horse Inn, Mattishill, Dereham, Norfolk (Norfolk); Plum Tree Farm, North Bank, Thorney, Peterborough, Northants (Isle of Ely).

October 13th, 1951.—Barling Green Farm, Headcorn, Ashford, Kent (Kent); Broadalls Farm, Fortyfoot Bridge, Ramsey, Huntingdon (Huntingdonshire); Four Hundred Farm, Ramsey, Huntingdon (Huntingdonshire); Hill Road, Christchurch, Wisbech, Cambs (Isle of Ely); Nafferton Farm Stocksfield, Northumberland (Northumberland); Catholic Hill Allotments, Dunchurch Road, Rugby, Warwickshire (Warwickshire); Gowdenview, Duntocher, Glasgow (Dunbartonshire).

October 15th, 1951.—High Street, Great Barford, Bedford (Bedfordshire); Howlett Hall High Westwood, Newcastle-on-Tyne (County Durham); Black Bank Road, Littleport, Ely, Cambs (Isle of Ely); Hundred Acre Farm, Harold Bridge, Parson Drove, Wisbech, Cambs (Isle of Ely); Hill Bungalow Stole, Diss, Norfolk (Norfolk); Round House, Bishopton, Stratford-on-Avon, Warwicks (Warwickshire); 7, Nostell Row, Nostell, Wakefield, Yorks (Yorkshire, West Riding); Cottington Court, Sholden, Deal, Kent (Kent); Grange Holdings Crimplesham, King's Lynn, Norfolk (Norfolk); Council Houses, Barnack, Stamford, Lincs (Soke of Peterborough); Catholic Hill Allotment, Rugby, Warwicks (Warwickshire); Birches Wood, Crackley Lane, Kenilworth, Warwicks (Warwickshire).

October 16th, 1951.—Air Force Station, Waterbeach, Cambridge (Cambridgeshire); Willow Farm, Hill Row, Haddenham, Ely, Cambs (Isle of Ely); Kirmond Road, Binbrook, Lincoln (Lincoln Parts of Lindsey); Hill Top Farm, Bentnall, Broseley, Shropshire (Wenlock).

October 17th, 1951.—Leverington Common, Wisbech, Cambs (Isle of Ely); Slinns Premises, Gadds Lane, Leverington, Wisbech, Cambs (Isle of Ely); Keyworth Farm, Benwick, March, Cambs (Isle of Ely); "Alderley," Cross Lane Head, Bridgnorth, Salop (Salop); Grange Farm, Holbeach St. Marks, Spalding, Lincs (Lincoln Parts of Holland); Glen Farm, Greatford, Stamford, Lincs (Lincoln Parts of Kesteven); 1, Council Houses, Acle Road, Moulton St. Mary, Norwich, Norfolk (Norfolk); Eve Lynn, Mill Lane, Saxilby, Lincoln (Lincoln Parts of Lindsey); Curf Farm, Chatteris, Cambs (Isle of Ely).

October 18th, 1951.—Bury Farm, Litlington, Royston, Herts (Cambridgeshire); Ministry of Food Slaughterhouse, March, Cambs (Isle of Ely); Mill Road Farm, Staple, Canterbury, Kent (Kent); Manor Farm, Owmby-by-Searby, Barnetby, Lincs (Lincoln Parts of Lindsey); Besenall Farm, Black Drove, Fincham, King's Lynn, Norfolk (Norfolk); 55, Elmtree Road, Carlton Colville, Lowestoft, Suffolk (Suffolk, East); King's Foundry Yard, Carleton New Road, Skipton, Yorshire (Yorkshire, West Riding).

* * * * *

Prohibition of Imports of Pig Meat and Pig Products from the Union of South Africa

Outbreaks of African swine fever have recently occurred in pigs in the Union of South Africa, and in order to prevent the introduction of this serious disease into Great Britain the Minister of Agriculture and Fisheries has made an Order prohibiting, as from November 1st, 1951, the importation of pig meat and pig products from the Union of South Africa. The prohibition does not extend to cooked and preserved meats, nor to lard and rendered fats.

Copies of the Order, entitled the Importation of Pig Meat and Pig Products (Prohibition) Order, 1951, may be obtained from the Animal Health Division of the Ministry of Agriculture and Fisheries, Hook Rise, Tolworth, Surbiton, Surrey.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

DWARFISM IN BEEF CATTLE

Sir,—In your issue of September 29th there appears the abstract headed "Dwarfism in Beef Cattle," and the following statements were made in the abstract: "Although reliable data were available on only one herd, reports show that the defect occurs in many pure-bred Hereford herds," and "Field reports tend to indicate that the frequency of the 'dwarfism' gene is increasing in the pure-bred Hereford population."

I was somewhat amazed to read these statements and took the trouble to read the original article, and apparently the authors were working from the South Dakota Agricultural Experiment Station. I do feel that this point should have been made quite clear in the abstract, because the original article made no reference whatsoever to Hereford cattle in Great Britain.

Some 80 years ago there were extensive importations of Hereford cattle into North America, but for many years the exportation of cattle to North America has practically ceased owing to the demand of the American Cattle Breeders' Association that all animals trace back to Volume XIII of the English Herd Book. The recent World Conference of Hereford Breeders dealt with this point, and it was agreed to recommend that "Pedigree records of Hereford cattle registered previous to July 12, 1951, in Great Britain, U.S.A., Argentina, Canada, Australia and Uruguay (New Zealand and South Africa subject to investigation of their records) be accepted as between these countries. The matter of the inclusion in their individual Herd Books of polled Herefords to be left to the discretion of the breed organisation in each country." The fact that North America has been a closed book for the importation of Hereford cattle for many years and the fact also that they have been inbreeding for many generations may account for the appearance of this defect "dwarfism." There is, however, no evidence whatsoever of the condition in British Herefords. Indeed, their popularity has been due to the fact that they have both weight and scale in comparison with the Scotch Beef Shorthorn and the Aberdeen Angus. There is no demand for any Hereford bulls unless they have both bone and scale.

It is to be regretted that the abstract omitted to explain where the condition is alleged to have occurred.—Yours faithfully, A. J. Wilsdon, 28, Folly Lane, Hereford. *October 15th*, 1951.

TUBERCULIN TESTING

Sir,—Mr. Lancaster bewails the fact that no one has replied to his suggestion that no cow be condemned unless it fails to pass two consecutive tests; he also dons the mantle of the prophet and predicts a milk famine next year, as many farmers are changing over to beef and rearing—the very thing they are subsidised by the Government to do.

It has at last dawned on the authorities that the milk business has reached the saturation point and that it is cheaper to import feeding-stuffs (we cannot grow enough) to feed our flocks and herds than to bring in beef, mutton and tinned ham.

There are not many more people in these islands than when Mr. Lancaster was a boy, but there are millions more milch cows than 30 years ago; where is all this milk going? Where is the butter and the cheese we used to enjoy in the golden days before our freedom was wrapped up in red tape?

Mr. Lancaster also says the A.I. people and ourselves must give assistance and encouragement to farmers: what assistance, what encouragement? The *philanthropic* days of the profession are over; the boot is on the other foot, and I will conclude by asking a question and answering it: What made this country great in the past? Beef and beer in England, porridge and whisky in Scotland, with a wee drap o' milk for the bairn.—Yours faithfully, J. Forbes, Truro. *October 13th*, 1951.

* * * * *

TUBERCULOSIS: BOVINE/HUMAN RELATIONSHIP

Sir,—In to-day's issue of the *Record* you publish a letter from Mr. George A. Willis, Royal Veterinary College, London, which gives certain figures. I should be glad if Mr. Willis would spend five minutes studying the trend of the figures in my letter published August 18th last. To me, the comparison between the high percentage attested counties and the low percentage attested counties indicates that the reduction in incidence of human pulmonary tuberculosis in the low percentage attested counties balances the enormous increase in the high percentage attested counties. In brief, the increase in pulmonary tuberculosis in the high percentage counties is due, in my opinion, to the Attested Cattle Scheme.

Will Mr. Willis study the summary and give his opinion? The notifications in the high percentage attested counties are still going up, whereas those in the low percentage attested counties are still going down.—Yours faithfully, L. Pitcher, 66, Coningsby Road, High Wycombe, Bucks. *October 13th*,, 1951.

* * * * *

SEDATIVE FOR FIREWORKS UPSET

Sir,—I had the temerity, in your correspondence columns last year, to mention the homoeopathic treatment of interdigital cysts. May I, greatly daring, bring the attention of your readers to a homoeopathic means of dealing with the not infrequent requests veterinary surgeons and animal welfare societies get during this season for something to quieten the nerves, of dogs in particular, that are upset by the explosion of fireworks. Many years ago in a medical homoeopathic materia medica I read that borax in homoeopathic attenuations had been found useful for "gun-shy" dogs. I have used it very successfully for this purpose for years, and when I came to be appointed to my present post the volume of requests for a drug of this nature during the "penny for the Guy" period of October and early November led me to try it out for this purpose. Last year we issued quite a large number of doses from some of the R.S.P.C.A. metropolitan clinics, and a sufficient number of people kept their promise and reported favourably on its value to make it worth while having a far more extended trial this year.

The treatment is simple; one tablet as soon as it is anticipated that nervous tension is to be created in any way. I usually recommend people during Guy Fawkes' week to give a tablet night and morning of the 3x homoeopathic attenuation. The prescription to a homoeopathic chemist will therefore be R Borax 3x tablets q.s. (One drachm of the tablets may be reckoned as comprising 25 doses.) The cost is negligible. I find milk sugar tablets are the desirable form, as these melt almost at once in the mouth and are not objected to by the recipient, being slightly sweet. I should be more than grateful if any users of this prescription would let me know their view of the efficacy or otherwise of the method.

I may add that there is good evidence to believe these borax tablets are of considerable use in removing apprehension on the part of dogs travelling by air or that are affected by thunder. So far I have had nothing but good reports following their use. They have, of course, the great advantage that there is no visible effect such as one gets from bromides and barbiturates—they simply ensure the *status quo ante*.—Yours faithfully, R. C. G. Hancock, Springhurst, Ecchinswell, Newbury, Berks. *October 19th*, 1951.